

# **Appendix A**

## **Post Authorization Changes in Total Project First Cost**

## **APPENDIX A**

### **POST AUTHORIZATION CHANGES IN TOTAL PROJECT FIRST COSTS SUMMARY**

Background: The Hamilton Wetland Restoration Project (HWRP)/Bel Marin Keys Unit V (BMK V) Project is a unique effort that combines multiple Federal authorities to implement a wetlands restoration project that beneficially reuses dredged material from Federal and non-Federal navigation projects. This results in unusual funding circumstances that are explained in detail in Appendix A and are briefly outlined in this summary.

The total project implementation costs for the Combined HWRP/BMKV Project will be funded through the HWRP/BMK V Project, the Oakland Deepening Project, and the other navigation projects using the project site. The Oakland Deepening Project authorization and Project Cooperation Agreement (PCA) require the Oakland Project to contribute 100% of the implementation costs associated with placing that project's estimated 2.5 mcy of Oakland material at the HWRP.

Under the Long Term Management Strategy (LTMS), many navigation projects will be precluded from disposing of dredged material in-Bay and must instead dispose at either the San Francisco Deep Ocean Disposal Site (SFDODS) or in upland sites. LTMS implementation will increase the dredged material transportation costs of a navigation project if the disposal site designated in accordance with the LTMS Implementation Plan is farther from the navigation channel than the disposal site used prior to LTMS implementation. Conversely, LTMS implementation will decrease transportation costs if the disposal site designated in accordance with the LTMS Implementation Plan is closer to the navigation channel than the pre-LTMS disposal site.

Incremental Costs: The HWRP Chief's Report and PCA authorize the HWRP to pay for the "incremental costs" of project implementation, defined as the difference between disposal costs at Hamilton versus the costs of disposal at the least-cost environmentally acceptable alternative. For all navigation projects, the least-cost environmentally acceptable alternative will be either disposal in-Bay, if permitted by the LTMS Implementation Plan, or at SFDODS.

Article I.B. of the HWRP PCA acknowledges that other projects, including but not limited to the Oakland Deepening Project, will directly fund a portion of the HWRP costs of implementation. This article further provides that these contributed funds will be excluded from the HWRP total project costs (in order to ensure, in part, that the Sponsor did not have to contribute a share of implementation costs that were actually being underwritten by an independent source).

The HWRP is required to fund not only the costs of offload, placement and reuse of dredged material delivered to the site by these navigation projects, but also any excess

costs of transporting that material to Hamilton, over and above the costs to deliver to the least-cost environmentally acceptable alternative site. For those Federal navigation projects that will incur greater cost to transport material to Hamilton than to their LTMS-designated in-Bay site, the HWRP will fund those “excess transportation costs” as an authorized component of the Project’s “incremental cost.” For those non-Federal navigation projects that will incur greater cost to transport material to Hamilton than to their LTMS-designated in-Bay site, the HWRP may – but is not obligated to – pay some or all of these “excess transportation costs” (the GRR project cost analysis assumes that full excess transportation costs will be paid to non-Federal projects, in order to provide maximum incentive to deliver dredged material to the HWRP).

Navigation projects that deliver dredged material to the HWRP, in lieu of disposing at SFDODS as their LTMS-designated site, will incur a decrease in transportation costs. This is because, for every navigation project within the Bay, the cost of transporting dredged material to Hamilton is less than the cost to transport and dispose at SFDODS. These Federal and non-Federal projects will transfer to the HWRP a “transportation cost differential” equal to the transportation cost savings realized by the shorter trip to the HWRP. The “Funding of HWRP Incremental Costs” section of the full Appendix A describes how these costs will be transferred from other navigation projects to the HWRP.

**HWRP Cost Adjustments:** The HWRP was authorized in WRDA 1999 at a cost of \$55.2 MIL. These costs were revised to reflect the cost increases associated with inflation, utility relocations, offloader standby costs, and excess transportation costs, as explained in Section 6.9.2 of the main text of Appendix A. The adjustments to the HWRP costs define the total HWRP implementation costs if the HWRP were to be constructed without the BMK V expansion. These costs are shown below:

#### **Adjusted Total HWRP Implementation Costs**

	(\$MIL)	
	Total Project Cost (1998\$)	Adjusted Total Project Implementation Cost (2002\$)
Lands, Easements, Rights of Way	0.3	0.4
Relocations	2.1	12.6
PED & Construction Mgmnt	4.1	16.3
Site Prep	19.3	19.6
Navigation Ports & Harbors	27.8	n/a
Offload/Placement	n/a	54.4
Excess Transportation Costs	n/a	12.9
Adaptive Management	1.5	2.8
<b>Total</b>	<b>55.2</b>	<b>119.0</b>

Combined HWRP/BMK V Costs: The adjusted the HWRP costs were added to the BMK costs to compute the total combined project implementation costs, displayed in the following table.

**Total Project Implementation Costs**  
**(\$MIL)**  
**(2002\$)**

	HWRP	BMK V	Combined Project
LERs	0.4	19.4	19.8
Relocations	12.6	0.3	12.9
PED & Construct. Mgmt	16.3	22.4	38.7
Site Prep	19.6	40.4	60.0
Offload/Placement	54.4	79.6	134.0
Excess Transport. Cost	12.9	16.7	29.6
Recreation	0.0	0.2	0.2
Adaptive Management	2.8	3.7	6.5
Total	119.0	182.7	301.7
Reference to Figure A-1	(B)	(C)	(A)

The total project implementation cost for the combined project forms the basis for the total first project cost, which defines the cost-sharing contributions for the Corps and the local Sponsor. The Oakland Deepening Project's contribution and the "transportation cost differential" funding provided by other navigation projects must be subtracted from the total project implementation cost to determine the total project first cost. This is necessary to avoid redundant Federal appropriations covering identical components of both the HWRP and other Federal navigation projects, and to account for contributions of "transportation cost differential" funding by non-Federal navigation projects. As shown in the table below, the total first project cost for the combined HWRP/BMK V project is \$188.3 MIL, and this figure will form the basis of cost-sharing. The total project first cost is equivalent to the project's "construction general" funding cost.

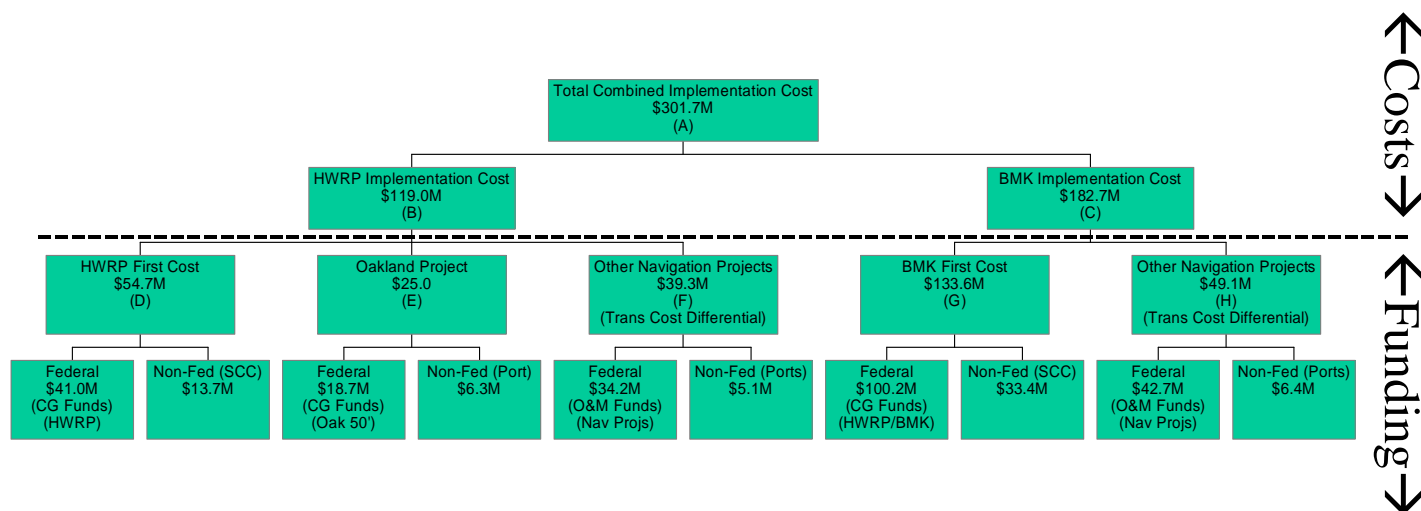
**Total Project First Costs**  
**(\$MIL)**

Total Project Implementation Cost for Combined Project	Oakland Project's Contribution	Other Navigation Project Contributions	Total Project First Cost
\$301.7 million	\$25.0 million	\$88.4 million	\$188.3 million
Figure A-1 reference (A)	Figure A-1 reference (E)	Figure A-1 reference (F+H)	Figure A-1 reference (D+G)

These costs are illustrated in Figure A-1, which shows cost figures that correspond to the tables above.

# Figure A-1

## HWRP/BMK Project Costs



1/Costs for Other Navigation Projects based on present projections of dredged material deliveries to the HWRP.

## **APPENDIX A**

### **POST AUTHORIZATION CHANGES IN TOTAL PROJECT FIRST COSTS**

This appendix provides a detailed description of the changes in total project first costs, as summarized in Section 6.9 of Chapter 6 of the main text of the General Reevaluation Report. The section numbers of this appendix are the same as those of the corresponding sections in Chapter 6.

#### **6.9.1 Long Term Management Strategy (LTMS) and Hamilton Wetland Restoration Project (HWRP) Costs**

The relationship between LTMS costs and HWRP project costs is described below.

The members of the Long Term Management Strategy (LTMS) Executive Committee signed and approved the Final LTMS Management Plan in January 2002. The members of the Executive Committee include the Corps of Engineers, the Environmental Protection Agency, the San Francisco Bay Regional Water Quality Control Board, the San Francisco Bay Conservation and Development Commission, and the State Water Resources Control Board. The Final LTMS Management Plan reduces the allowable in-bay disposal volumes of dredged material by more than 50% compared to pre-LTMS volumes. Implementation of LTMS will require that much of the dredged material that has historically been placed in the bay be placed in upland sites or in the ocean. Other than the small volume that the smaller navigation projects will continue to be allowed to dispose of in-Bay, dredged material disposal will be evenly allocated between upland and ocean sites, and full allocation to upland or ocean disposal will be phased in over 12 years.

Presently, the LTMS Implementation Plan is not mandating any upland disposal, but has designated ocean disposal for some navigation projects and will be designating disposal at the San Francisco Deep Ocean Disposal Site (SFDODS) for other projects as the implementation transition period proceeds. Thus, implementation of LTMS will have no immediate impact on the disposal costs of those projects presently disposing at the ocean site. However, since in-bay disposal is the least costly alternative, implementation of LTMS will increase the cost of navigation improvements and associated maintenance for the projects currently using in-bay disposal sites that will instead place dredged material upland or at the ocean site under the LTMS Implementation Plan. The magnitude of the post-LTMS cost increase will vary from project to project, and will depend on the location of the present disposal site and whether the new disposal destination is upland or in the ocean. Upland sites must be developed to accommodate the new disposal strategy, and the cost to develop these sites for Federal projects will be funded, at least in part, by the Corps' navigation construction and O&M programs.

The tables below illustrate the cost increases associated with LTMS implementation for two hypothetical navigation projects: First, consider a project with a Pre-LTMS in-bay disposal site. If the project shifts from in-bay to ocean disposal following LTMS implementation, the transportation costs will increase for the project. The LTMS cost increase (or LTMS incremental cost) would be \$6/cubic yard (cy). There will always be a cost increase to shift from in-bay to ocean disposal because the distance from every navigation project in the Bay to the ocean disposal site is farther than the distance to the corresponding in-bay site.

**COST INCREASES ASSOCIATED WITH LTMS IMPLEMENTATION  
SHIFT FROM IN-BAY TO OCEAN DISPOSAL**

	<b>Pre-LTMS Cost (\$/cy)</b>	<b>Post-LTMS Cost (\$/cy)</b>	<b>LTMS Incremental Cost (\$/cy)</b>
<b>Item Description</b>	<b>In-Bay Disposal</b>	<b>Ocean Disposal</b>	<b>Ocean Disposal</b>
Site preparation & offload/placement	N/A	N/A	N/A
Dredge & transport to disposal site	\$7	\$13	\$6
Total	\$7	\$13	\$6

If the project shifts from in-bay to upland disposal, two new expense items would be incurred (site preparation and offload/placement). These costs would add \$9/cy to the overall disposal cost. The cost associated with dredging and transportation could increase or decrease depending on the relative locations of the in-bay site, the upland site, and the navigation project site. The hypothetical scenario in the table below assumes that the pre-LTMS in-bay site would be slightly closer to the navigation project than the Hamilton site, resulting in a moderate cost increase to the navigation project's transportation component. If the project shifts from in-bay to upland disposal, the hypothetical overall LTMS cost increase would be \$10/cy.

**COST INCREASES ASSOCIATED WITH LTMS IMPLEMENTATION  
SHIFT FROM IN-BAY TO UPLAND DISPOSAL**

	<b>Pre-LTMS Cost (\$/cy)</b>	<b>Post-LTMS Cost (\$/cy)</b>	<b>LTMS Incremental Cost (\$/cy)</b>
<b>Item Description</b>	<b>In-Bay Disposal</b>	<b>Upland Disposal</b>	<b>Upland Disposal</b>
Site preparation & offload/placement	\$0	\$9	\$9
Dredge & transport to disposal site	\$7	\$8	\$1
Total	\$7	\$17	\$10

### Authorized HWRP Incremental Costs

The HWRP was authorized in WRDA 1999 at a cost of \$55.2 MIL. Project features included preconstruction engineering and design (PED), site preparation, and material offload and placement costs for 10.6 million cubic yards (mcy) of material to be placed at the HWRP site.

#### **Authorized HWRP Costs**

(\$ MIL)

<b>1998 Hamilton Project Cost (excluding Bel Marin Keys expansion)</b>	
	HWRP WRDA '99 Cost (1998 MIL\$)
Lands, Easements and Rights of Way	0.3
Relocations	2.1
PED & Construction Mgmnt	4.1
Site Prep	19.3
Navigation Ports & Harbors	27.8
Adaptive Management	1.5
Total	55.2

1/ The Project Cooperation Agreement (PCA) defines the 902 Limit as \$72.4 MIL.

As described above, implementation of LTMS will have no immediate impact on disposal costs for those navigation projects presently disposing at the ocean site. However, those navigation projects currently disposing at in-bay sites for which disposal designations will change under LTMS implementation will have to either pay higher transportation costs to take material to the ocean or additional costs to place material in upland sites. The HWRP was authorized to fund the “incremental cost of transportation and disposal of dredged material.” This Hamilton incremental cost is defined, in paragraph 6 of the Chief’s Report, as the value by which the costs of transportation and disposal of dredged material to the HWRP exceed the costs of transportation and disposal at the least-cost environmentally acceptable disposal alternative. This authority effectively allows the HWRP to share the LTMS incremental cost with the navigation projects.

Because the LTMS implementation plan has designated ocean disposal for some navigation projects, but has not mandated use of any upland disposal site, the least-cost environmentally acceptable disposal alternative for the navigation projects delivering material to the HWRP will either be at an in-bay site or ocean disposal. Costs associated with dredging and transporting material to the HWRP site are to be funded by the individual navigation projects placing material at HWRP, *to the extent of those projects' estimated costs of dredging, transportation, and disposal at the least-cost environmentally acceptable alternative disposal site determined in accordance with the*



*LTMS implementation plan.* All costs of transportation to and placement and reuse at the HWRP that exceed the transportation and disposal costs of this least-cost environmentally acceptable alternative disposal method, are to be allocated to Hamilton total project costs. These excess costs are defined as HWRP **incremental costs**.

The incremental cost allows the HWRP to share the costs of beneficial reuse of dredge material with Federal and non-Federal navigation dredging projects. With the HWRP contribution to the LTMS implementation costs, San Francisco Bay dredging projects acquire the intangible benefit of “green” reuse of dredged material at an ecosystem restoration site vice in-water disposal as well as predictability in the permitting process and in the degree of public acceptance of dredging activities, without having to pay the cost premium that would otherwise be associated with such beneficial reuse.

Illustration of the basic application of the Hamilton “incremental cost” concept is relatively straightforward. A typical navigation project will contract directly for dredging and transporting the material to Hamilton. The HWRP will take the material from there: offloading and placing the material onshore for construction of the restoration project. The HWRP will directly contract for, and fund the costs of, those offload, placement, and ecosystem development costs.

There will be navigation projects for which the costs to dredge and transport to Hamilton will be greater than the costs of dredging and disposing at the alternate in-Bay site designated in accordance with LTMS implementation. For the Federal projects that fall into this category, Article II.F. of the HWRP Project Cooperation Agreement (PCA) specifies that the funding responsibility for this cost difference will be allocated to the HWRP, as a component of Hamilton’s “incremental cost.” The HWRP will thus transfer the appropriate funding to cover this excess transportation cost to that Federal navigation project to offset a portion of its dredging and transportation contract. For non-Federal navigation projects where the costs to dredge and transport to Hamilton are greater than the costs to dredge and dispose at the alternative in-Bay site designated in accordance with LTMS implementation, the PCA provides that the HWRP has the discretion to contribute toward this transportation cost difference (as well as all other components of Hamilton incremental costs). If the HWRP needs the volume of material represented by that non-Federal project, the HWRP may elect to pay some or all of the incremental cost in order to provide an incentive to deliver that material to Hamilton.

A number of navigation projects presently dispose of dredged material at SFDODS as their “least-costly environmentally acceptable alternative.” These projects presently include the following projects shown below. It will be less expensive for these projects to dredge and transport material to Hamilton, than to dredge and transport offshore to SFDODS for ocean disposal.

Federal	Non-Federal
Oakland Deepening	Port of Oakland berths maintenance
Oakland Harbor maintenance	Port of Richmond berths maintenance
Richmond Harbor maintenance	

More navigation projects will be shifted from in-bay to ocean disposal as LTMS implementation is gradually phased in. Those projects must assume the additional costs associated with LTMS implementation, regardless of whether the HWRP is an available disposal option or not. For example, the Oakland Harbor maintenance project and the Richmond Harbor maintenance project must now pay the costs of SFDODS disposal as their least-cost environmentally acceptable disposal option. The fact that the HWRP presents a beneficial reuse opportunity at no extra premium provides those projects the incentive to choose to place material at Hamilton in lieu of offshore disposal. The costs of SFDODS disposal, for the Oakland and Richmond maintenance projects, constitute a minimum fixed cost, from this point forward.

The incremental costs associated with two hypothetical projects are illustrated in Figures 6-1 and 6-2. In both cases, the HWRP costs for PED, site preparation, and material offloading and placement is \$8.63/cy.

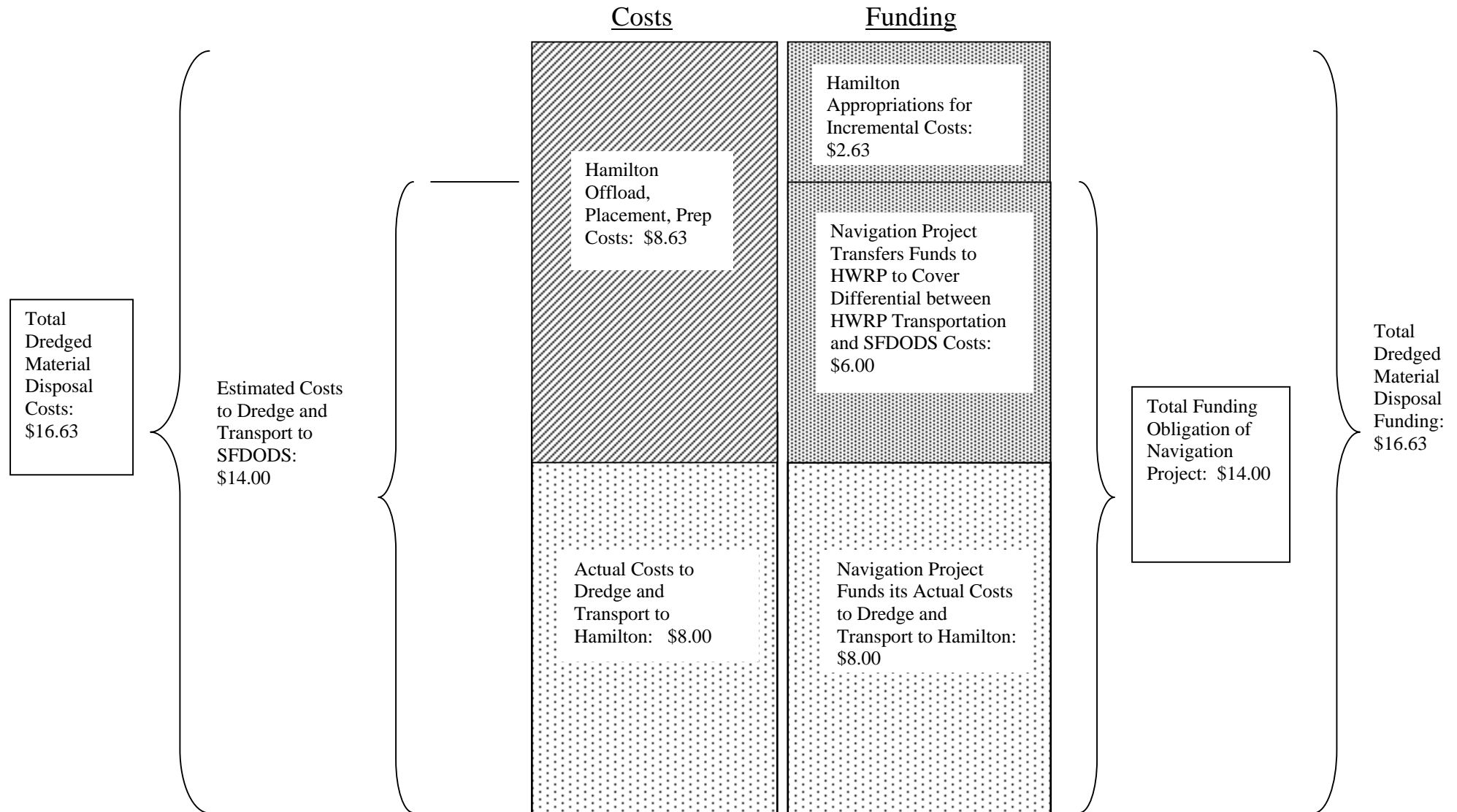
Figure 6-1 illustrates a navigation project that has a least-cost environmentally acceptable alternative disposal site at SFDODS. In this case, the project would pay \$14/cy to dredge and haul material to its LTMS-designated ocean disposal site. When this project dredges and hauls material to HWRP instead of SFDODS, it will continue to pay a cumulative sum of \$14/cy for dredged material disposal, and the HWRP will fund the remaining disposal costs associated with the HWRP, or \$2.63/cy, which are the incremental costs. In this case, the incremental costs do not include any costs associated with transporting the material to the HWRP site because it is cheaper to haul the material to the HWRP site than to SFDODS. The navigation project will pay (to its dredging contractor) \$8/cy to dredge and haul the material to the HWRP site plus pay (to the Hamilton Project) an additional \$6/cy for HWRP site preparation, offloading, and placement costs. Thus, the navigation project is paying no more and no less than the cost of its least-cost environmentally acceptable alternative disposal method, and the HWRP pays the incremental cost associated with beneficial reuse of dredged material at the HWRP site.

Figure 6-2 illustrates a navigation project that has a least-cost environmentally acceptable alternative disposal site within San Francisco Bay. In this case, the project would pay \$7.21/cy to dredge and haul material to the LTMS-designated in-bay site. When this project dredges and hauls material to HWRP instead of the in-bay site, it will fund its expected cost of \$7.21/cy for dredged material disposal, and the HWRP will fund the remaining disposal costs associated with the HWRP, or \$9.26/cy, which are the incremental costs associated with the HWRP. In this case, the incremental costs include the additional costs associated with transporting the material to the HWRP (\$0.63/cy) as well as the site preparation, offload and placement costs. Again, the navigation project is paying no more and no less than the cost of its least-cost environmentally acceptable alternative disposal method, and the HWRP pays the incremental cost associated with beneficial reuse of dredged material at the HWRP site.

**FIGURE 6-1**

**Navigation Project with Alternate Disposal Method that Utilizes SFDODS**

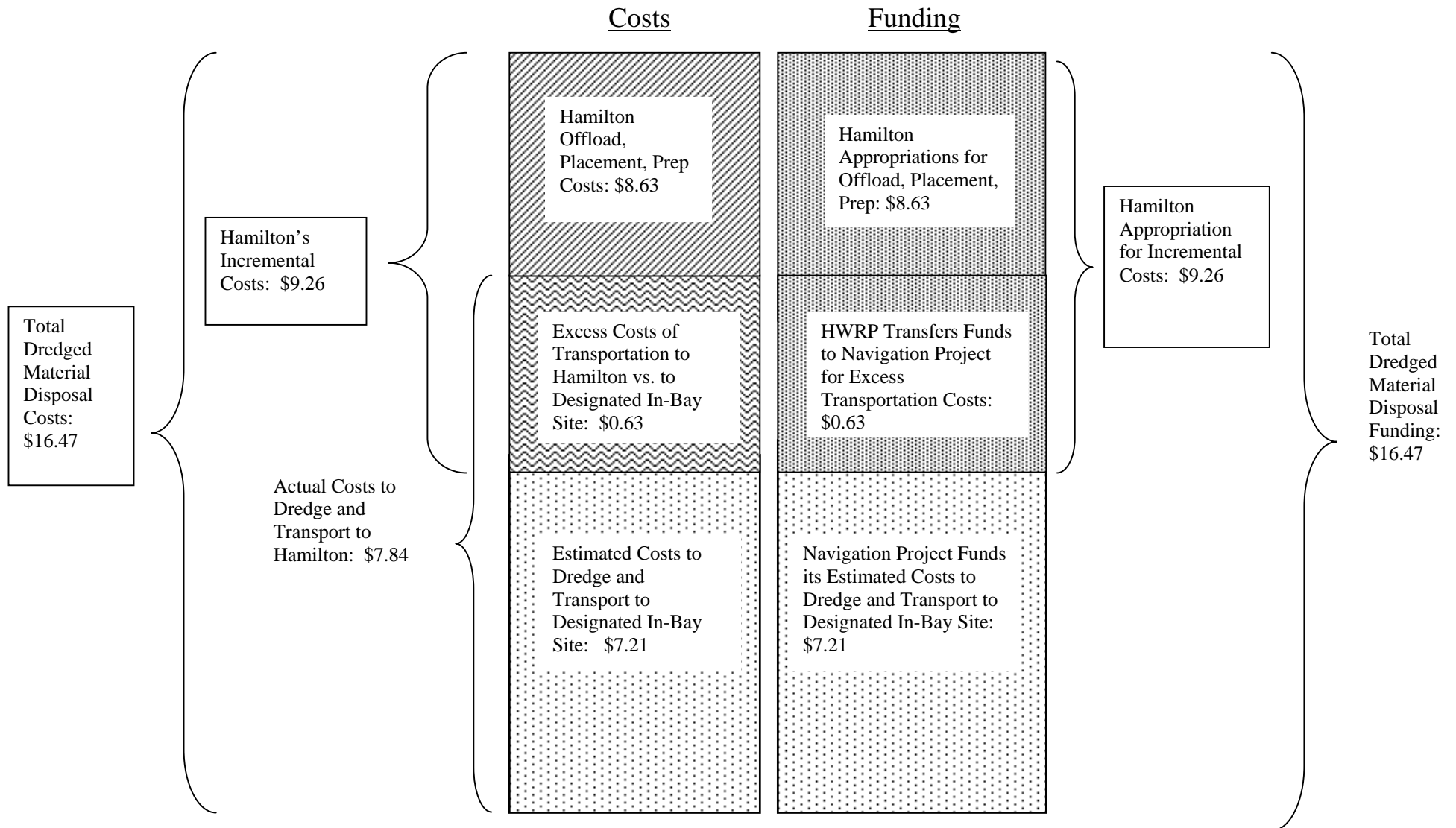
(Value figures are illustrative, based on the Oakland Maintenance Project)



**FIGURE 6-2**

**Navigation Project with Alternate Disposal Method that Utilizes In-Bay Site**

(Value figures are illustrative, based on the Pinole Shoals Maintenance Project)



## **Funding of HWRP Incremental Costs**

Differential Costs Associated with the Shift from Ocean to HWRP Disposal: It is appropriate and necessary that those navigation projects with ocean disposal sites would transfer funding to the HWRP that corresponds to the value of the savings they would otherwise see in reduced dredged material transportation costs, where that cost differential is made possible by the existence of the HWRP. In other words, this savings to the navigation dredging community, made possible by the HWRP's proximate location and the HWRP's contribution of incremental costs, should more properly accrue to the Hamilton Project itself, than to the individual navigation projects.

Each navigation project designated under LTMS for ocean disposal must therefore pay (with each annual maintenance episode constituting a separate project) to the HWRP the cost differential between (1) that project's estimated costs to dredge, transport to, and dispose of material at its LTMS-designated disposal alternative, and (2) that project's actual costs to dredge and transport material to Hamilton, for subsequent offload at HWRP expense. The requirement to pay this cost differential to the HWRP will not modify the total funding obligations of the navigation projects. Each navigation project will pay the same amount as they would be paying for dredging and SFDODS disposal, but will merely be paying a portion to their dredging and transportation contractor and the balance to the HWRP.

There is ample support for application of the concept of requiring the navigation projects that would otherwise dispose of dredged material at SFDODS to contribute their transportation and disposal cost savings to the HWRP.

a. Paragraph 6 of the HWRP Chief's Report expressly acknowledges that "a portion of [the transportation, offload, placement, and site preparation] costs will actually be funded by other navigation projects." Paragraph 6 specifically discusses the unique cost-sharing relationship between the HWRP and the Oakland Deepening project, but also notes that there are a number of projects intended to fund a portion of HWRP costs other than the Oakland new-work project. The fact that San Francisco Bay navigation projects will generally be contributing funds to offset a portion of HWRP implementation costs is thus specifically acknowledged in the Chief's Report.

b. The provisions of the HWRP PCA also accommodate transfer of these contributions of cost savings from navigation projects to the HWRP. Article I.B. acknowledges that other projects, including but not limited to the Oakland Deepening Project, will directly fund a portion of the HWRP costs of implementation. This article further provides that these contributed funds will be excluded from the HWRP total project costs (in order to ensure, in part, that the Sponsor did not have to contribute a share of implementation costs that were actually being underwritten by an independent source). Additionally, Article II.F. mandates that "no costs shall be allocated to the Project which are to be directly funded" by another navigation project, including but not limited to the Oakland Deepening Project.

c. Finally, as discussed above, there is express authorization for Hamilton to fund and execute the activities associated with the HWRP “incremental cost,” but no authorization to exceed the scope of this incremental cost’s funding authority and further share in, or offset, the dredged material disposal costs of navigation projects within San Francisco Bay.

It is important to note that this transfer of funds, representing a navigation project’s cost savings arising from the availability of the HWRP, does not constitute a “tipping fee.” A tipping fee would involve an allocation of the Hamilton Project’s costs among the navigation projects placing dredged material at the site, presumably in relation to the volume of material contributed as a proportion of total HWRP capacity. The transfer of funds reflecting the differential between transportation costs associated with SFDODS versus Hamilton use is not calculated based on HWRP implementation costs, however. In fact, Hamilton’s costs are completely irrelevant to the computation of the amount of funds to be transferred. The value of funds to be transferred depends solely on the navigation project’s costs – or more particularly the savings that would otherwise be seen in those costs, resulting from the opportunity to use the Federal restoration project at Hamilton.

The value of the transportation cost differential to be transferred would be computed, for Federal projects, as follows: the actual cost of the Federal contract to dredge the material and transport it to Hamilton for subsequent offloading would be subtracted from the MCACES estimate for dredging that same volume of material, and transporting it to and disposing it at the least-cost environmentally acceptable disposal option, as designated under the LTMS implementation plan. Presently, the only San Francisco Bay navigation projects that would otherwise be expected to experience such a cost differential and would thus be required to transfer these funds, are the projects disposing of dredged material at SFDODS.

The value of the transportation cost differential to be transferred. Presently, the Port of Oakland and Port of Richmond berths maintenance projects are designated for SFDODS disposal, and would therefore be required to pay to the HWRP the cost differential between Hamilton transportation costs and SFDODS transportation/disposal costs. The value of the funds transfer would be established in an MOA in which the other terms and parameters of the dredged material placement authorization would also be reflected. The value of funds to be transferred would be computed, for these non-Federal projects, as follows: the Federal MCACES estimate of the reasonable cost of the proponent’s contract to dredge the material and transport it to Hamilton for subsequent offloading (taking into consideration, but not dictated by, the actual cost of that non-Federal contract) would be subtracted from the MCACES estimate for dredging that same volume of material, and transporting it to and disposing it at the least-cost environmentally acceptable disposal option, as designated under the LTMS implementation plan.

Acceptance by the HWRP of these “differential cost” payments does not constitute an impermissible augmentation of funds in violation of Federal fiscal law. The Chief’s Report, incorporated by express reference into the WRDA 1999 authorization of the Project, indicates that “a portion of these [HWRP implementation] costs will actually be

funded by other navigation projects.” This statement expressly provides statutory authority for the HWRP to utilize funding from sources other than the funds directly appropriated to the Hamilton Project. The Chief’s Report specifically cites the Oakland Deepening Project as one such likely source, but notes that other navigation projects could also serve as such a source. As these Oakland Deepening Project funds include both Federally-appropriated Oakland Project funds as well as the Sponsor’s cost-share contributions, the Hamilton Project authorization implicitly authorizes augmentation of HWRP funds with both Federal funds originally appropriated to another specific purpose, as well as with non-Federal funds.

It was clearly the intent of Congress to authorize direct augmentation of Hamilton Project funds by both Federal and non-Federal funds, rather than to treat these funds as miscellaneous receipts for deposit in the Treasury general fund. The authorization to accept these augmenting funds from “other navigation projects” that include both Federal and non-Federal projects is merely implicit, however.

To provide predictability and clear direction, the implicit features of the HWRP funding sources should be made explicit in the statutory re-authorization language. This language should expressly authorize that “the monies received from the Oakland Harbor Navigation Improvement (-50-Foot) Project as its proportionate share of the implementation costs of the Hamilton Wetland Restoration Project, or received from other Federal or non-Federal navigation projects within San Francisco Bay and representing the amount by which the dredging and transportation costs of such a navigation project incurred in delivering dredged material to the Hamilton site for subsequent offload and placement exceed the costs such a navigation project would have incurred in disposing of that volume of material under the least-cost environmentally acceptable disposal alternative designated in accordance with the Long Term Management Strategy Implementation Plan for Placement of Dredged Material in the San Francisco Bay Region, shall be available to the Secretary, and shall be used by the Secretary, for the implementation of the Hamilton Wetland Restoration Project, and shall be excluded from the computation of the maximum cost of the Project, as that term is used in 33 USC § 2280.” Such express language would be fully consistent with Articles I.B. and II.F. of the Hamilton PCA.

Excess Transportation Costs Associated with the Shift from In-Bay to HWRP Disposal:  
As discussed previously, there are a number of Federal navigation projects for which the costs of dredging and transporting to Hamilton exceed the costs associated with dredging, transporting to, and placing at the least-cost environmentally acceptable disposal option.

For all Federal projects that presently continue to be authorized to use in-Bay disposal sites, the costs of transporting dredged material to Hamilton will be greater than the costs of the alternative in-Bay site. The HWRP will pay these excess transportation costs to the navigation project, through an inter-project administrative transfer of funds. This component of costs forms a portion of the Hamilton incremental costs, which are to be allocated to HWRP total project costs, as provided in the HWRP PCA.

The value of the excess transportation costs to be paid by the HWRP would be computed, for Federal projects, as follows: the actual cost of the Federal contract to dredge the material and transport it to Hamilton for subsequent offloading, less the MCACES estimate for dredging that same volume of material, and transporting it to and disposing it at the in-Bay site.

There are also non-Federal navigation projects to which excess transportation costs will be paid. Article II.F. of the HWRP PCA provides the Project the discretion to either pay incremental costs to non-Federal projects or to decline to do so. These incremental costs would include, for non-Federal navigation projects that remain authorized to dispose of dredged material in-Bay and as long as the HWRP elects to pay them to attract the material from that non-Federal project, the amount of the HWRP offload and placement costs as well as a sum that is no greater than the amount by which the navigation project's costs to transport to Hamilton exceed the costs to transport to the LTMS-designated in-Bay site.

The value of funds to be transferred to the non-Federal navigation projects as excess transportation costs would be computed as follows: the Federal MCACES estimate of the reasonable cost of the proponent's contract to dredge the material and transport it to Hamilton for subsequent offloading (taking into consideration, but not dictated by, the actual cost of that non-Federal contract), less the MCACES estimate for dredging that same volume of material, and transporting it to and disposing it at the in-Bay site.

The table below illustrates the application of the HWRP incremental cost and differential cost concepts. Two representative categories of projects were chosen for purposes of comparison: a major harbor maintenance project (Oakland) required under LTMS implementation to dispose of its dredged material at SFDODS; and a smaller navigation maintenance project where the costs to dredge and transport to Hamilton are greater than the costs of dredging, transporting to, and disposal at the LTMS-designated in-Bay disposal site (Pinole Shoals). Note that, theoretically, there is a third category of projects: projects where the costs to dredge and transport to Hamilton are less than the costs of dredging, transportation to, and disposal at the LTMS-designated in-Bay disposal site. However, as a practical matter, there are no navigation projects in San Francisco Bay authorized for in-Bay disposal for which the unit costs of dredging and transporting to Hamilton are less than the costs of dredging, transporting to, and disposing at the LTMS-designated alternative. If such projects existed, incremental and differential costs would be addressed in a manner similar to those projects designated for disposal at SFDODS.

The following table provides a tabular illustration of these concepts. Cost category A, in the table below, illustrates the total costs incurred for a cubic yard of dredged material from the point of dredging all the way through offload and placement at Hamilton. Cost category B illustrates the cost to the navigation project of dredging, transporting to, and disposing at the site designated under the LTMS Implementation Plan. Cost category C illustrates the incremental costs as defined in the PCA: the total costs of dredging all the way through offload, placement, and site preparation at Hamilton, minus the total costs to dredge, transport to, and dispose of an equivalent volume of material at the site designated under the LTMS Implementation Plan. Cost category D illustrates the



navigation project's actual costs to dredge and transport material to Hamilton for subsequent offload and placement. Cost category E is the excess cost incurred by the navigation project, if any, to dredge and transport to Hamilton. Any excess cost in category E will be paid by the HWRP to the navigation project, and will be accounted for as part of Hamilton's incremental cost. Finally, cost category F is the differential, if any, between the navigation project's actual costs to dredge and transport to Hamilton, and the authorized extent of the HWRP's incremental costs. This is the difference between the navigation project's costs to dredge/transport/dispose at the LTMS-designated site, and that project's actual costs to dredge and transport to Hamilton. This transportation cost differential will be paid by the navigation project to the HWRP.

Those navigation projects with a post-LTMS designated disposal site of SFDODS will pay a significant differential per cubic yard to the HWRP. Those navigation projects for which the LTMS-designated disposal site is in-Bay will be compensated by the HWRP a moderate amount, offsetting a portion of the navigation project's dredging and transportation costs. Computation of this moderate payment will be primarily dependent upon the difference in transportation costs from the navigation project to Hamilton versus the transportation costs from the navigation project to the LTMS-designated in-Bay site.

**Application of Hamilton Incremental Cost and Differential Cost Concepts**  
(Value figures are illustrative)

	<u>Navigation Projects Designated under LTMS for Disposal at:</u>	
	<u>SFDODS</u>	<u>In-Bay</u>
A. Total costs of navigation project to dredge/ transport/offload/place at Hamilton (in (\$/cy))	\$16.63	\$16.47
B. Costs of navigation project's alternative disposal method	\$14	\$7.21
C. HWRP's incremental costs (Total costs minus least-cost alternative) [ <i>A minus B</i> ]	\$2.63	\$9.26
D. Navigation project's actual costs to dredge/ transport to Hamilton	\$8	\$7.84
E. Amount by which HWRP costs exceed the costs of the alternate disposal method (positive values only; paid by the HWRP to the navigation project as part of the HWRP "incremental cost") [ <i>D minus B</i> ]	\$0	\$0.63
F. Transportation cost differential between the Hamilton-subsidized costs and the navigation project's actual costs (paid by the navigation project to the HWRP) [ <i>A minus C minus D plus E</i> ]	\$6	\$0

## 6.9.2 Post-WRDA HWRP Implementation Cost Adjustments

In anticipation of the re-authorization of the HWRP to add the BMK V parcel, the design team has revised the original WRDA 1999 project cost for HWRP to reflect the cost increases associated with inflation, utility relocations, offloader standby costs, and excess transportation costs.

### PED and Site Preparation

PED (including construction management) costs were adjusted from 1998\$ to 2002\$ as shown below. These costs were adjusted to account for the lengthy construction period, required overtime and changed labor rates. Costs were added to PED for value engineering studies. Site preparation costs were adjusted to reflect current conditions and adjusted for inflation.

**Table 6-4 PED 1/ Costs (\$million)**

<b>1998\$</b>	<b>Inflated to 2002\$</b>
4.1	16.3

1/ includes construction management costs

**Site Preparation Costs (\$ MIL)**

	<b>1998\$</b>	<b>Inflated to 2002 \$</b>
Site Prep	19.3	19.6
Adaptive Management	1.5	2.8

### Utility Relocation Costs

The HWRP feasibility study assumed that the existing Novato Sanitary District outfall could be protected during construction by slip-lining the pipeline and leaving it in place during construction. However, PED investigations have indicated that a much longer portion of the pipeline would require slip-lining, thus increasing the costs beyond the point of being cost-effective. It was concluded that the most cost-effective method to protect the existing outfall pipeline would be to replace it in-kind with an adjacent plastic (HDPE) pipeline. The utility relocation cost increased as a result of this analysis.

**Utility Relocation Costs (\$ MIL)**

<b>1998\$</b>	<b>Increased Utility Costs</b>	<b>Adjusted Cost 2002\$</b>
2.1	+10.5	12.6

### Offload/Placement Costs

The WRDA 1999 HWRP costs included a line item for “Navigation Ports and Harbors” that accounted for offload and placement costs and that was based on an average cost of \$2.62/cy. For clarity, this line item has been broken out into offload/placement costs and excess transportation costs.

The offload/placement costs were computed for the combined HWRP/BMK V project and then the HWRP and BMK V proportionate shares of these costs were calculated based on the volume of material that would be required for the HWRP and for the BMK V addition. Table A-1 the end of Appendix A presents the data that were used to compute the offloader mobilization/demobilization and operational costs. Columns “K” and “L” of Table A-1 display the unit costs associated with these activities. These unit costs were multiplied by the volume of material to be delivered by each respective navigation project to the combined HWRP/BMK V project to compute the total offloader operating and mobilization/demobilization cost, shown in column “O”. This cost was then added to the following offloader construction and standby costs to compute the total offload cost for the combined project.

#### Total Offload Costs for the Combined HWRP/BMK V Project

	\$MIL
offload operating and mob/demob (Table A-1 column “O”)	\$ 71.0
offloader platform/pipeline/electrification	\$ 6.6
offloader equipment standby	\$ 17.8
offloader labor standby	\$ 21.5
Subtotal	\$ 116.9
contingency	\$ 13.2
<b>Total</b>	<b>\$ 130.1</b>

Note: The Hamilton feasibility study assumed that the offloader mechanism would operate continuously throughout the construction period. However, the revised design assumes that the offloader will be in a standby mode for approximately 15 to 20% of the project construction period. Offloader equipment and operators must be paid during this standby time. These standby costs were not accounted for in the original feasibility cost estimate.

To obtain an updated estimate of the offload/placement costs attributable specifically to the HWRP, this total adjusted costs for the combined HWRP/BMK V Project was divided by the proportion of total volume capacity ascribed to the HWRP:

<u>Offload/Placement Costs (\$ MIL)</u>	
<u>1998\$</u>	<u>2002 \$ Adjusted Cost</u>
27.8	54.4

### Excess Transportation Cost

As discussed previously, Federal and non-Federal navigation projects that presently dispose of dredged material at in-Bay sites would incur additional transportation costs to dredge and transport material to Hamilton instead of to their designated in-Bay sites. In each of these cases, the HWRP will fund this “excess transportation cost” of hauling the material to Hamilton. The excess transportation cost has been computed based on the volume of material expected to be delivered from each of the applicable navigation projects over the life of the HWRP. As many of the remaining individual in-bay projects shift to SFDODS disposal during implementation of LTMS, the excess transportation cost will be eliminated, and the projects will instead pay to the HWRP the cost differential as described in the section above, entitled “Funding of HWRP Incremental Costs”.

The LTMS Implementation Plan requires that in-bay disposal gradually shift to ocean or upland disposal over a 12-year period. Because the LTMS navigation project-by-project schedule has not yet been developed for those projects still disposing of dredged material in-Bay, assumptions were made regarding projected LTMS implementation for the purposes of computing excess transportation costs for the HWRP: for the first 3-year period, 25% of the in-bay volume was presumed to shift shifted to ocean or upland sites; for the second 3-year period, it was presumed that 50% of the in-bay volume will be shifted to ocean or upland sites; the percentage increases to 75% and 100% for the third and fourth 3-year periods, respectively.

Because the project-by-project LTMS implementation schedule is unknown at this time, three different implementation scenarios were explored for the purposes of computing excess transportation costs and cost differentials.

LTMS Implementation Scenario 1: For this first case, it was assumed that those projects currently placing material at in-bay sites would continue to do so throughout the HWRP/BMK V construction period. None of that material would shift to ocean disposal during the HWRP implementation period.

LTMS Implementation Scenario 2: For this second case, it was assumed that those projects currently placing material at in-bay sites would shift to ocean disposal at the LTMS implementation rate: 25% for first 3-year period, 50% for second 3-year period, 75% for third 3-year period, and 100% for fourth 3-year period and beyond. The volume of in-bay material would gradually decline over the HWRP/BMK V construction period, ultimately reaching a point of 100% ocean disposal for all projects delivering material to the HWRP/BMK V combined project.

LTMS Implementation Scenario 3: The ultimate goal of LTMS is to reduce the volume of in-bay disposal to 1 million cubic yards (mcy) per year by the beginning of 2012. Very small projects will receive priority to maintain their present entitlement to in-bay disposal. Of the 1.0 mcy goal, approximately one-quarter of that volume will be reserved for these very small projects. For this third case, it was assumed that those in-bay

projects bringing material to the HWRP would account for the remaining three-quarters of in-bay disposal volume. In other words, it was assumed that, collectively, those projects would continue to dispose up to 750,000 cy of material in-bay, and that the remaining volume of dredged material derived from Bay navigation projects would be taken to SFDODS. The computation for this scenario assumed the same gradual rate of shift from in-Bay to SFDODS disposal as in Scenario 2, but overlaid this computation with an assumption that the first 750,000 cy of material would remain entitled to in-Bay disposal.

Table A-1 at the end of Appendix A computes the excess transportation costs for Scenario 1, which becomes the base case. Under this “no LTMS shift” scenario, the excess transportation costs associated with continued in-bay disposal totals \$32.0 MIL (column “Q”). Table A-2 computes the shifts in volume from in-bay to ocean disposal for LTMS Implementation Scenarios 2 and 3 and the associated reduction in excess transportation costs and the increase in differential costs. Table A-2 shows the following results for the combined HWRP/BMK V project:

**Summary of LTMS Implementation Scenarios  
for the Combined HWRP/BMK V Project**

Scenario	Vol. Shifted from In-Bay to Ocean (cy)	Reduction in Excess Transportation Costs <u>1/</u>	Increase to Differential Transportation Costs <u>2/</u>
1	0	\$0	\$0
2	7,502,000	\$23,959,000	\$62,898,000
<b>3</b>	<b>754,000</b>	<b>\$2,407,000</b>	<b>\$6,320,000</b>

1/ Reduction from base excess transportation cost of \$32.0 MIL

2/ Increase to base differential cost of \$82.1 MIL

When these cost adjustments are applied to the base case presented in Table A-2, the excess transportation costs and differential transportation costs are modified as follows:

**Adjustments to Excess Transportation Costs  
and Differential Transportation Costs  
as a Result of LTMS Implementation Scenarios**

Scenario	Comparison of the HWRP's Excess Transportation Costs (\$MIL)			Comparison of Differential Transportation Costs to be Paid to the HWRP (\$MIL)		
	Total	HWRP Share	BMK V Share	Total	HWRP Share	BMK V Share
1 (base case)	\$32.0	\$13.9	\$18.0	\$82.1	\$36.5	\$45.6
2	\$8.1	\$3.5	\$5.0	\$144.9	\$64.3	\$80.6
<b>3</b>	<b>\$29.6</b>	<b>\$12.8</b>	<b>\$17.0</b>	<b>\$88.4</b>	<b>\$39.3</b>	<b>\$49.1</b>

Scenario 1 was included for illustrative purposes, but was rejected for cost estimating purposes because it makes no attempt to project a schedule of LTMS implementation and to estimate the associated cost impact to the HWRP. Of the two remaining, the third scenario illustrates the greater net cost to the HWRP and thus the more conservative implementation assumption. Scenario 3 was used as the basis for computing excess transportation costs and differential transportation costs for this analysis for the combined HWRP/BMK V project. The proportionate shares of these costs for the HWRP and the BMK V expansion were computed based on their proportionate shares of volume of dredged material to be delivered to the project site. Utilizing Scenario 3, the excess transportation costs for the HWRP would be approximately \$12.8 MIL.

The adjustments to the HWRP costs define the total HWRP implementation costs if the HWRP were to be constructed without the BMK V expansion. These costs are shown below:

#### **Adjusted Total HWRP Implementation Costs**

	(\$MIL)	
	Total Project Cost (1998\$)	Adjusted Total Project Implementation Cost (2002\$)
Lands, Easements, Rights of Way	0.3	0.4
Relocations	2.1	12.6
PED	4.1	16.3
Site Prep	19.3	19.6
Navigation Ports & Harbors	27.8	n/a
Offload/Placement	n/a	54.4
Excess Transportation Costs	n/a	12.9
Adaptive Management	1.5	2.8
Total	55.2	119.0

#### **6.9.3 Oakland Deepening Project Contribution to HWRP Implementation Costs**

The HWRP and the Oakland 50-foot deepening project were both authorized in WRDA 1999. WRDA 1999 authorized both projects to place Oakland dredged material at the HWRP. The HWRP was authorized to share site preparation and offload/placement costs with navigation projects using the site, by accepting funding contributions from the Oakland Deepening Project, among others. The Oakland Harbor Navigation Improvement (-50-Foot) Project Cooperation Agreement (PCA), which was signed in July of 2001, requires the Oakland Project to contribute 100% of the PED, site preparation, and offload/placement costs associated with placing that volume of material dredged from the Deepening Project and delivered to the HWRP, which the Oakland Project authorization estimated at 2.5 mcy. This requirement does not apply to Oakland maintenance material.

The Oakland Deepening Project is generally assigned the funding responsibility for approximately 25% of the costs of beneficial use at the HWRP; of this proportion, the Oakland PCA estimates that the Oakland Project's share of the Hamilton site preparation costs (not including Hamilton's offload and placement costs) will be \$5.2 MIL. The Oakland contributions are based on the following assumptions:

- a. The Oakland Project will deliver all 2.5 mcy to HWRP.
- b. The Oakland Project's share of costs is computed based on its proportional contribution to total cubic yardage delivered to the HWRP site (2.5 mcy/10.6 mcy = 23.58%).
- c. The Oakland Project is expected to contribute 23.58% of the estimated total volume of dredged material to be placed on the HWRP site. A 23.58% fraction of the site preparation, PED and construction management, relocations, lands and damages, and offload/placement costs has been calculated for attribution to the Oakland Project. The Oakland Project is not responsible for paying any portion of excess transportation costs associated with other navigation projects.

Based on the adjusted total HWRP implementation costs, the Oakland Deepening Project will contribute approximately \$25 million toward the HWRP costs, leaving the remaining \$94 million to be funded by the HWRP and other navigation projects using the site.

**Oakland Deepening Project Contribution  
to HWRP Total Project Implementation Cost  
(\$MIL)**

	Adjusted Total HWRP Implementation Cost (2002\$)	Oakland Deepening Project Contribution (2002\$)
LERs	0.4	0.1
Relocations	12.6	3.0
PED & Construction Costs	16.3	3.8
Site Prep	19.6	4.6
Offload/Placement	54.4	12.8
Excess Transportation Costs	12.9	N/A
Adaptive Management	2.8	0.7
Total	119.0	25.0

#### **6.9.4 Total Implementation Costs for Combined HWRP and BMK V Project**

The following table displays the estimated total project implementation costs for the combined HWRP/BMK V project. The cost figures for the BMK V portion are presented in Chapter 5 of this report.

**Total Project Implementation Costs  
(\$MIL)  
(2002\$)**

	HWRP	BMK V	Combined Project
LERs	0.4	19.4	19.8
Relocations	12.6	0.3	12.9
PED & Construct. Mgmt	16.3	22.4	38.7
Site Prep	19.6	40.4	60.0
Offload/Placement	54.4	79.6	134.0
Excess Transport. Cost	12.9	16.7	29.6
Recreation	0.0	0.2	0.2
Adaptive Management	2.8	3.7	6.5
Total	119.0	182.7	301.7

**6.9.5 Other Navigation Project Contributions to HWRP/BMK V Combined Project Implementation Costs**

The total project implementation costs for the Combined HWRP/BMK V Project will be funded through the HWRP/BMK V Project, the Oakland Deepening Project, and the other navigation projects using the project site. The Oakland Deepening Project's contribution is estimated to be \$25 million, as detailed above.

As discussed previously, those other Federal and non-Federal navigation projects designated under the LTMS Implementation Plan to dispose of dredged material at SFDODS will contribute funding to the HWRP. The funding contribution will be calculated as a cost differential: the difference between the estimated costs of dredging, transportation to and disposal at SFDODS, and the actual costs of dredging and transportation to Hamilton. The schedule of material to be delivered to the site from other navigation projects is presented in Table 2 provided at the end of Appendix A. These quantities were used to compute the funding contribution to the HWRP from navigation projects presently disposing of dredged material at SFDODS.

The total project implementation cost for the combined project forms the basis for the total first project cost, which defines the cost-sharing contributions. The Oakland Deepening Project's contribution and the other navigation projects' contributions must be subtracted from the total project implementation cost to determine the total project first cost. This is necessary to avoid redundant Federal appropriations covering identical components of both the HWRP and other Federal navigation projects, and to account for contributions to the HWRP's total project implementation costs derived from non-Federal navigation projects providing funding to the HWRP as determined by those projects' transportation costs differential. As shown in the table below, the total first project cost for the combined HWRP/BMK V project is \$188.3 MIL, and this figure will form the basis of cost-sharing. The total project first cost is equivalent to the project's "construction general" funding cost. The total project first cost is \$133.0 MIL greater than the original authorized amount of \$55.2 MIL.



**Total Project First Costs  
(\$MIL)**

Total Project Implementation Cost for Combined Project	Oakland Project's Contribution	Other Navigation Project Contributions	Total Project First Cost
\$301.7 million	\$25.0 million	\$88.4 million	\$188.3 million

**6.9.6 Changes to Total Project First Costs for Combined HWRP and BMK V Project**

The following table displays the estimated costs for the combined HWRP/BMK V project, the HWRP project as authorized by WRDA 1999, the authorized project updated to current price levels, and the project last recommended to Congress.

**Changes in Total Project First Costs  
(\$MIL)**

Recommended Project Costs (2002 \$)	Authorized (WRDA 99) (1998 \$)	Updated Authorized Costs (2002 \$)	Costs Last Presented to Congress (2001\$)
\$188.3	\$55.2	\$119.0 <u>1/</u>	\$63.2

1/ The updated authorized costs presented here are the HWRP adjusted project implementation costs.

**TABLE A-1**  
**COMPUTATION OF**  
**EXCESS AND DIFFERENTIAL TRANSPORTATION COSTS**  
**BETWEEN CURRENT DISPOSAL SITES AND HAMILTON SITE**  
**FOR COMBINED HWRP/BMK PROJECT**  
**(Excludes Costs Associated with Site Preparation, PED, or LERRDs)**

			Current Disposal Site Costs			Hamilton Disposal Site Costs							
	No. Dredging Episodes	Volume Material for HWRP/BMK thru 2015 (mcy)	Unit Cost to Dredge & Haul, Excluding Mob/Demob (\$/cy)	Mob/Demob Cost per Dredging Episode (\$/cy)	Cumulative Ocean or In-Bay Site Dredge & Haul Cost thru 2015 (\$/cy)	Unit Cost to Dredge & Haul, Excluding Mob/Demob (\$/cy)	Mob/Demob Cost per Dredging Episode (\$/cy)	Unit Cost of Offloading Operation (\$/cy)	Unit Cost of Offloading mob/Demob (\$/cy)	Cumulative HWRP/BMK Dredge/Haul and Offload Cost thru 2015 (\$/cy)			
	B	C	E	F	G	I	J	K	L	M	O	Q	R
					(E*C+F*B)					(I*C)+(J*B)+(K+L)*C	(K+L)*C	M-O-G ( Positive Values)	M-O-G (Negative Values)
<b>Federal Projects</b>													
<u>Ocean Sites</u>													
Oakland (O&M)	12	4.858	\$ 12.74	\$ 546,120	68,444,360	\$ 6.45	\$ 442,682	\$ 1.54	\$ 0.74	\$ 47,715,604	11,069,320		\$ (31,798,076)
Richmond	12	4.608	\$ 13.05	\$ 543,972	66,662,064	\$ 5.21	\$ 258,000	\$ 1.52	\$ 0.69	\$ 37,275,840	10,172,160		\$ (39,558,384)
Oakland -50'	1	2.5	\$ 11.47	\$ 3,025,000	31,700,000	\$ 6.81	\$ 2,906,000	\$ 2.83	\$ 0.12	\$ 27,304,000	7,373,000		n/a (Note B)
<u>In-Bay Sites</u>													
Pinole Shoal	6	1.188	\$ 6.04	\$ 234,230	8,580,900	\$ 6.01	\$ 258,000	\$ 2.76	\$ 1.33	\$ 13,550,760	4,862,880	\$ 106,980	
Redwood City	4	1.728	\$ 7.77	\$ 320,124	14,707,056	\$ 7.66	\$ 425,000	\$ 1.54	\$ 0.69	\$ 18,793,600	3,857,120	\$ 229,424	
Southampton Shoal	12	3.3	\$ 3.36	n/a (Note A)	11,088,000	\$ 5.21	\$ 258,000	\$ 1.52	\$ 0.96	\$ 28,473,000	8,184,000	\$ 9,201,000	
					\$ 201,182,380					\$ 173,112,804	\$ 45,518,480	\$ 9,537,404	\$ (71,356,460)
<b>Non-Fed Projects</b>													
<u>Ocean Sites</u>													
Oakland Berths	12	1.08	\$ 12.74	\$ 546,120	20,312,640	\$ 6.45	\$ 442,682	\$ 1.54	\$ 3.32	\$ 17,529,384	5,251,200		\$ (8,034,456)
Richmond Berths	4	0.2	\$ 13.05	\$ 543,972	4,785,888	\$ 5.21	\$ 258,000	\$ 1.52	\$ 5.28	\$ 3,434,000	1,360,000		\$ (2,711,888)
<u>In-Bay Sites</u>													
Chevron	12	1.44	\$ 3.52	\$ 287,000	8,512,800	\$ 5.81	\$ 258,000	\$ 1.52	\$ 2.20	\$ 16,819,200	5,356,800	\$ 2,949,600	
Larkspur	6	1.425	\$ 3.52	\$ 287,000	6,738,000	\$ 10.83	\$ 300,000	\$ 3.40	\$ 1.26	\$ 23,871,750	6,639,000	\$ 10,494,750	
Port of S.F.	12	2.136	\$ 3.52	\$ 287,000	10,962,720	\$ 5.81	\$ 258,000	\$ 1.52	\$ 1.68	\$ 22,340,880	6,834,720	\$ 4,543,440	
					\$ 51,312,048					\$ 83,995,214	\$ 25,441,720	\$ 17,987,790	\$ (10,746,344)
<b>Subtotals</b>		<b>24.46</b>			\$ 252,494,428					\$ 257,108,018	\$ 70,960,200	\$ 27,525,194	\$ (82,102,804)
Adjustments			Add offloader electrification, standby and contingencies & excess trans cost contingencies.										
Subtotal			Subtotal of offload costs. (LTMS base case)										
LTMS Adjustments			Less \$2.4M excess trans costs & increase diff. trans costs by \$6.3M to account for phase-in of LTMS.										
<b>Totals</b>											\$ 130,128,000	\$ 29,618,194	\$ (88,422,804)

NOTE A: Southampton dredging costs include mob/demob costs for hopper dredging.  
NOTE B: Oakland 50' costs are provided by the Oakland 50' project, rather than by HWRP.

**TABLE A-2**  
**VOLUMES FOR PROJECTS WITH IN-BAY DISPOSAL SITES**  
**ADJUSTED TO ACCOUNT FOR LTMS SHIFT**  
**FROM IN-BAY TO OCEAN DISPOSAL**  
(1,000 CY)  
(\$1,000)

	>			<--50% LTMS Implementation-->			<---75% LTMS Implementation--->			<-----100% LTMS Implementation----->					
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
<b>FEDERAL O&amp;M PROJECTS WITH PRE-LTMS IN-BAY DISPOSAL</b>															(1,000 cy)
Pinole Shoals <sup>1</sup>	0	0	0	198	0	198	0	198	0	198	0	198	0	198	1,188
Redwood City Harbor <sup>1</sup>	0	0	0	432	0	0	432	0	0	432	0	0	432	0	1,728
Southampton Shoals	0	0	275	275	275	275	275	275	275	275	275	275	275	275	3,300
<b>TOTAL</b>	0	0	275	905	275	473	707	473	275	905	275	473	707	473	<b>6,216</b>
<b>RUNNING TOTAL</b>	0	0	275	1,180	1,455	1,928	2,635	3,108	3,383	4,288	4,563	5,036	5,743	6,216	

<b>NON-FEDERAL PROJECTS WITH PRE-LTMS IN-BAY DISPOSAL</b>															(1,000 cy)
Chevron	0	0	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Larkspur Ferry Channel <sup>2</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port of San Francisco	0	0	178	178	178	178	178	178	178	178	178	178	178	178	2,136
<b>TOTAL</b>	0	0	298	298	298	298	298	298	298	298	298	298	298	298	<b>3,576</b>
<b>RUNNING TOTAL</b>	0	0	298	596	894	1,192	1,490	1,788	2,086	2,384	2,682	2,980	3,278	3,576	

<b>ANNUAL TOTAL</b>	0	0	573	1,203	573	771	1,005	771	573	1,203	573	771	1,005	771	<b>9,792</b>
<b>ANNUAL RUNNING TOTAL</b>	0	0	573	1,776	2,349	3,120	4,125	4,896	5,469	6,672	7,245	8,016	9,021	9,792	

<b>Scenario 1: Assumes no in-bay material shifts to SFDODS. (Base case)</b>															(1,000 cy)
<b>ANNUAL GRAND TOTAL</b>			573	1,203	573	771	1,005	771	573	1,203	573	771	1,005	771	<b>9,792</b>
LTMS VOLUME TO SHIFT TO SFDODS			0	0	0	0	0	0	0	0	0	0	0	0	<b>0</b>
VOLUME TO REMAIN IN-BAY			573	1,203	573	771	1,005	771	573	1,203	573	771	1,005	771	<b>9,792</b>

															(1,000)
Decrease to Excess Trans. Cost			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Increase to Cost Differential			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

<b>Scenario 2: Assumes in-bay material shifts to SFDODS up to LTMS implementation percentage.</b>															(1,000 cy)
<b>ANNUAL GRAND TOTAL</b>			573	1,203	573	771	1,005	771	573	1,203	573	771	1,005	771	<b>9,792</b>
LTMS VOLUME TO SHIFT TO SFDODS			143	602	287	386	754	578	430	1,203	573	771	1,005	771	<b>7,502</b>
VOLUME TO REMAIN IN-BAY			430	602	287	386	251	193	143	0	0	0	0	0	<b>2,291</b>

															(1,000)
Decrease to Excess Trans. Cost			\$ 458	\$ 1,921	\$ 915	\$ 1,231	\$ 2,407	\$ 1,847	\$ 1,373	\$ 3,842	\$ 1,830	\$ 2,463	\$ 3,210	\$ 2,463	<b>\$ 23,959</b>
Increase to Cost Differential			\$ 1,201	\$ 5,043	\$ 2,402	\$ 3,232	\$ 6,320	\$ 4,848	\$ 3,603	\$ 10,087	\$ 4,804	\$ 6,465	\$ 8,427	\$ 6,465	<b>\$ 62,898</b>

<b>Scenario 3: Assumes in-Bay material shifts to SFDODS, but also assumes 750K cy/yr remains exempt from SFDODS (remains in-bay).</b>															(1,000 cy)
<b>ANNUAL GRAND TOTAL</b>			573	1,203	573	771	1,005	771	573	1,203	573	771	1,005	771	<b>9,792</b>
LTMS VOLUME TO SHIFT TO SFDODS			0	0	0	0	4	0	0	453	0	21	255	21	<b>754</b>
VOLUME TO REMAIN IN-BAY			573	1,203	573	771	1,001	771	573	750	573	750	750	750	<b>9,038</b>

olumes less than 750K cy are assumed to all remain in-bay

															(1,000)
Decrease to Excess Trans. Cost			\$ -	\$ -	\$ -	\$ -	\$ 12	\$ -	\$ -	\$ 1,447	\$ -	\$ 67	\$ 814	\$ 67	<b>\$ 2,407</b>
Increase to Cost Differential			\$ -	\$ -	\$ -	\$ -	\$ 31	\$ -	\$ -	\$ 3,798	\$ -	\$ 176	\$ 2,138	\$ 176	<b>\$ 6,320</b>

Weighted Avg Excess Trans Cost      \$ 3.19    Excess Trans Cost from Column "Q" of Table A-1 / total in-bay volume (excludes Larkspur)  
Weighted Avg Differential Costs        \$ 8.38    Differential Cost from Column "R" of Table A-1 / total in-bay volume (excludes Larkspur)

<sup>1</sup>Dredge predictions provided by USACE in scope

<sup>2</sup>Larkspur Ferry Channel assumed to be exempt from LTMS due to unlikely cost-effectiveness of shallow draft ocean disposal.